Hudson Bay Mining and Smelting Co., Limited

Annual Report 1972

Forty-fifth
annual meeting
of shareholders

April 27, 1972

Hudson Bay Mining and Smelting Co., Limited

This brief report has been prepared for the benefit of those shareholders who were unable to attend the Annual Meeting held on April 28, 1972.

The meeting convened at 11 a.m. in the Manitoba Room at the Royal York Hotel, Toronto, Ontario, Canada.

The Annual Report of the Directors and of the Auditors, including financial statements of the Company for the year 1971, were submitted.

The following Directors were elected: Eric S. Austin, H. Ronald Fraser, W. A. Green, Allen T. Lambert, J. F. McCarthy, H. C. F. Mockridge, W. A. Morrice, Gavin W. H. Relly, Maurice W. Rush and C. V. Whitney.

There were no changes in the Officers of the Company from that shown in the Annual Report for 1971.

Messrs. Deloitte, Haskins & Sells, Chartered Accountants, were appointed auditors for the ensuing year.

Included is a transcript of the report by W. A. Morrice, President, and the announcement made by Gavin W. H. Relly, Chairman.

The meeting concluded at 12 noon.

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cover photo

Stikine Copper Limited's property in northwestern British Columbia is accessible only by helicopter.

Announcement by
Gavin W. H. Relly
Chairman

Hudson Bay Mining and Smelting Co., Limited has concluded a two-stage arrangement whereby the Company can increase its 19% interest in Stikine Copper Limited in northwestern British Columbia to 45%.

The Stikine property, held 76% by Kennecott Copper Corporation, of New York, and 5% by Cominco Ltd., of Vancouver, is approximately 200 miles north-northwest of Prince Rupert. A widely spaced drilling program in the mid-1960's indicated a porphyry type deposit containing more than 100 million tons grading in excess of 1% copper in an extensive mineralized area.

The arrangement with Kennecott and Cominco calls for Hudson Bay Mining to finance and manage a drilling and preliminary engineering program over a maximum of five years at a maximum cost of $3.3 million. To the extent that funds are spent on the program Hudson Bay Mining will take down further treasury shares in Stikine to increase its interest up to an additional 16%. If it is decided to begin detailed feasibility studies aimed at financing the property to production, then Hudson Bay Mining under certain circumstances will have the right to take down additional shares to increase its interest to 45%. Cominco has indicated it will maintain its 5% interest.

Stikine is remotely located in an area devoid of infrastructure. I should make it clear, therefore, that at this time we regard this venture as being of a strictly prospecting nature. However, as I have stated, the area is widely mineralized and we feel the project has very interesting potential.

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Report of
W. A. Morrice
President

Mr. Chairman, ladies and gentlemen, I also am pleased to welcome you to the annual meeting of shareholders.

On March 27 a copy of the Annual Report for 1971 was mailed to every shareholder. I will therefore only briefly review the highlights of last year's operations and offer some comments as to what lies ahead for the Company.

You are all aware of the results of the strike last year that shut down the Company's mines and metallurgical plants in northern Manitoba from January 27 to June 21. The Company had a loss of $110,000 in the first quarter of 1971; at the end of the first half, the loss had increased to $1.9 million; profits in the third quarter reduced the accumulated loss to $425,000; then in the last quarter the Company realized total profits of $3.4 million, leaving a net profit for the year of just over $3 million.

Labor-management relations

It is not my intention to conduct a post-mortem on the strike but I want to make it clear that management is most anxious to assure that labor-management relations are on a sound footing.

In this regard, among other things, the Company has taken two positive steps. An independent labor consultant is conducting an in-depth survey of relations with the unions in Flin Flon. In addition the Company's attitudes and actions are being re-examined by our senior personnel.

One significant result of the strike was that all nine unions agreed to bargain collectively with respect to welfare plans. A Pension Plan committee comprised of union and Company representatives was established with the responsibility of recommending appropriate changes in the present plan. Satisfactory progress is being made.

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cover photo Stikine Copper Limited's property in northwestern British Columbia is accessible only by helicopter.

As announced in the Annual Report a number of programs have been initiated to increase the efficiency and improve the productivity of operations to counteract rising operating costs as far as possible.

In brief, the programs are as follows:

1. **Planned Maintenance Program**

The main objective of this program is to plan and schedule maintenance work to improve equipment performance and thus reduce breakdowns to a minimum. This will lead to more efficient use of maintenance personnel and possibly a reduction in staff. To date the program has shown encouraging results.

2. **Industrial Engineering Study**

The objective of this program is to review operating procedures with emphasis on production and manpower utilization. A team of industrial engineering technicians will be trained in work-study analysis. This program will be in operation by July, 1972.

3. **Plant Upgrading Program**

A planning committee was set up last year to develop a comprehensive Plant Upgrading Program for Flin Flon and Snow Lake areas.

The aims of the program are:

a) To increase productivity and generally improve the profitability of the Flin Flon and Snow Lake operations.

b) To establish and maintain environmental conditions compatible with the operations and satisfactory to governments.

Management has not yet completed its studies to enable final recommendations to be made to the board of directors.

The main areas we are examining cover the smelter, the zinc plant, ore-handling and concentrator-handling facilities. It is expected considerable capital expenditure will be involved but this will be offset to some extent by a reduction in capital requirements for new mine development. The phasing out of the three-year tax-free period under the new tax laws has led to our rescheduling our mining program so as to spread capital requirements for this purpose over a longer period. While I cannot give you figures at this stage it seems likely that the program of plant upgrading will fall well within our ability to

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finance from our own resources, particularly as some of the projects will take several years to plan and complete.

Three new mines in 1972

Three new mines will be brought into production during 1972, namely the White Lake Mine in the Flin Flon area, the Ghost Lake Mine in the Snow Lake area and the Wellgreen Mine in the Yukon.

It was indicated in the Annual Report that the White Lake Mine would commence production in August, 1972. It is now considered advisable to bring this mine on stream in mid-June. Ore reserves are quoted at 333,000 tons assaying 2.62% Cu and 5.4% Zn. Production will be at a rate of 450 tons per calendar day.

Estimated production date for the Ghost Lake Mine is September, 1972, at a production rate of 250 tons per calendar day. Ore reserves are 261,000 tons grading 1.14 oz. Ag, 1.42% Cu and 11.6% Zn.

As stated in the Annual Report the startup of the Wellgreen operation, in which Hudson Bay Mining has a 95% interest, was delayed from the original date of January, 1972.

The delay was necessary because of unexpected complexities in the orebody. Despite intensive diamond-drilling and development work carried out in the mid-1950's, major problems have been revealed in developing the mine for production. Although the grade of ore and tonnage have remained relatively unchanged the mineable reserves have been greatly reduced. As we have developed the mine for production it has become clear that the orebody has very little continuity in both the horizontal and vertical planes. It has so far proved impossible within economic limits to set up a method of mining which will sustain an extraction program which is likely to endure at the rate necessary to ensure an overall profitable program. We are continuing for the meantime to develop all possible sources of ore for production, which will start on May 1 when millfeed will be supplemented by ore from the development stockpile but we must face the probability of having to absorb substantial losses on this project.

Potash operations satisfactory

Operations of Sylvite of Canada, the Company's potash division located at Rocanville, Saskatchewan, continue

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photo

ine Copper Limited's property in northwestern British Columbia is accessible only by helicopter.

to operate in a satisfactory manner. Production of muriate of potash totalled 157,000 tons for the first quarter and operations produced a modest profit despite continuing weak markets. Anticipated production allocation for Sylvite for 1972 is 600,000 tons of product, up from 500,000 tons in 1971.

The potash industry in Saskatchewan, already operating at a low level of profitability, is threatened by more adverse possibilities. The Saskatchewan Government recently indicated it would impose a levy of 60¢ per ton on potash sold outside the province. In addition, legislation has been introduced that would double the provincial acreage tax, to 20¢ per acre. And perhaps most ominous of all is the recently introduced legislation that empowers the Saskatchewan Government to form a marketing board for the purchase and sale of all Saskatchewan potash.

All these developments could seriously damage the industry since even under current conditions potash producers are not receiving a satisfactory return on investment. What impact the government's marketing move will have cannot be forecast at this time.

Oil and gas developments

Francana Oil & Gas Ltd., the oil and gas subsidiary of the Company, has reported that first-quarter crude oil sales increased 24.6% while sale of natural gas increased 83.9% over the 1971 level. Earnings were decreased somewhat, however, as a result of higher depreciation, depletion and interest costs. Substantial investments were made in 1971 which do not contribute to current earnings but have great promise for the future. Francana, as well as being active in Saskatchewan and Alberta, has substantial holdings in the Arctic and off the East Coast. Of considerable interest, of course, are its holdings adjacent to the recent Panarctic Romulus C-42 discovery. Francana participates internationally through its 22% interest in Trend Exploration Limited, a Denver-based company. With such broad exposure, optimism is high in the Francana organization.

Manufacturing subsidiaries

During the past year, Zinc Oxide Company of Canada Limited operated at near capacity and is expected to continue on this basis for the balance of the year. The

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company has been caught in a profit-cost squeeze of depressed product prices, but improved earnings are expected for the balance of the year due to recent price increases for both zinc dust and zinc oxide. Production of a photoconductive oxide for copypaper coatings has been expanded and the premium price for this product should be reflected in higher earnings.

Hudson Bay Diecastings Limited completed a very successful year and the plant's production for 1972 has been sold. However, automotive parts are taken on a fixed-price basis and increased only because of higher metal costs. Increased costs for both labor and materials other than metal could adversely affect profits.

Extensive exploration

The Company's exploration subsidiary, Hudson Bay Exploration and Development Company Limited, conducts an extensive exploration program, largely in Manitoba and Saskatchewan. Further, the Company continues to manage an exploration program shared on a 50-50 basis with the Anglo American Corporation of Canada Limited (AMCAN) in the Yukon, British Columbia and Ontario. The exploration program consists of grass-roots prospecting, aerial geophysics, as well as ground geophysics and geochemistry (where applicable) leading to the diamond-drilling of selected targets.

Despite the problems encountered in 1971, it was decided not to reduce the exploration budget because ore reserves are the lifeblood of our base-metal operations.

Reference was made in the 1970 Annual Report to a mineralized zone intersected at Reed Lake, in the Flin Flon area. Further drilling in 1971 has indicated 1,142,000 tons at 2.18% Cu to a vertical depth of some 1,400 feet. This zone is open at depth but under present conditions this deposit is not considered economic and will be shelved awaiting more favorable conditions.

Recent work near Barrington Lake in the Lynn Lake area in northern Manitoba has indicated a zone of copper mineralization along a strike length of approximately 350 feet grading approximately 2.5% Cu over approximately 15 feet. We are continuing to drill this deposit but present indications do not encourage the view that it is of major importance.

Diamond-drilling on the Tom claims, Yukon Territory, intersected significant silver-lead-zinc mineralization.

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This information together with results from previous work indicates approximately 9,000,000 tons grading 2.75 oz. Ag, 8.4% Zn and 8.1% Pb. Good potential for additional ore exists, particularly at depth but no further work is planned until transportation and other supporting facilities are improved.

Other interests

With respect to Baffinland Iron Mines Limited, our reassessment feasibility studies covering the iron ore deposits at Mary River in Baffinland have continued throughout the year. They have taken into account the possibility of using high-tonnage ice-reinforced ships to transport the ore from Baffinland to an ice-free location in Canadian waters for further processing and transshipment.

Although the report is not yet complete it appears unlikely that the venture would be viable without massive government support for the necessary supporting services, including ocean transport from Baffinland.

Turning to joint-venture projects, a number of interesting mineral occurrences have been found in Ontario, British Columbia and the Yukon and follow-up work is planned for the future. The Company has negotiated on behalf of Hudson Bay and AMCAN an option agreement with Whitehorse Copper Mines Ltd. to explore property held by Whitehorse Copper immediately north of their Little Chief Mine near Whitehorse in the Yukon.

Hudson Bay Mining and AMCAN each has a $6,025,000 investment in Whitehorse Copper Mines Ltd. Ore reserves are estimated at 2.7 million tons grading 2.4% Cu. To date a sales agreement for the copper concentrates has not been finalized and in the current unfavourable concentrate market it may prove difficult to obtain as satisfactory an agreement as originally visualized.

The Company continues to investigate opportunities for investment in other mining properties both in Canada and abroad.

Profit in first quarter

I am very pleased to announce that net earnings for the first quarter were $4,037,988, equivalent to 45¢ per share, compared with a loss of 1¢ per share for the first

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quarter of 1971 and a profit of 38¢ per share for the fourth quarter of 1971.

Improvements in metallurgy in the concentrator, more efficient smelter operations and a higher throughput of ore enabled the Company to realize from its own ores a 10% increase in blister copper as well as a further increase of 5% from purchased concentrates. It is unlikely that production from Hudson Bay ores will continue at the present level for the balance of the year but smelter output will remain relatively constant by treating more purchased concentrates.

In conclusion, Hudson Bay Mining is well equipped both with resources and staff to cope with the many problems that lie ahead. Despite the difficulties mentioned earlier in this report the outlook for the Company is one of continuing growth.

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A request for proxies
was mailed with this report
to all shareholders
during the latter part of
March, 1973.

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Hudson Bay Mining and Smelting Co., Limited

Directors and Officers

Directors

E. S. Austin
Delta, B.C.
Former President, Hudson Bay Mining

H. R. Fraser
Toronto
President, Anglo American Corporation of Canada Limited

W. A. Green
Riverside, Conn.
Former President, Hudson Bay Mining

A. T. Lambert
Toronto
Chairman and Chief Executive Officer, The Toronto-Dominion Bank

J. F. McCarthy
Old Greenwich, Conn.
Former Secretary and Treasurer, Hudson Bay Mining

H. C. F. Mockridge, Q.C.
Toronto
Senior Partner, Osler, Hoskin & Harcourt

W. A. Morrice
Toronto
President, Hudson Bay Mining

G. W. H. Relly
Toronto
Chairman, Hudson Bay Mining

M. W. Rush
Johannesburg, South Africa
Director, Anglo American Corporation of South Africa Limited

C. V. Whitney
New York
President, Whitney Industries, Inc.

Officers

G. W. H. Relly, Chairman of the Board
W. A. Morrice, President
H. A. McKenzie, Executive Vice-President
C. O. Buchanan, Vice-President - Metal Sales
J. L. Carpenter, Vice-President, Secretary, General Counsel
L. W. Ogryzlo, Vice-President - Exploration
Dr. C. L. Sarthou, Vice-President - Marketing (Sylvite Division)
J. S. Warick, Vice-President - Mining
K. S. Dalton, Treasurer
G. A. C. MacRae, Comptroller
S. A. Hayward, Assistant Secretary and Assistant Treasurer

Report of the Directors

Introduction

The Canadian mining industry did not enjoy a particularly satisfactory year in 1972. Financial results, because of lower metal prices, uncertain markets and higher costs, were disappointing on the whole but the pure profit statistics tell only part of the story. Prospecting activity was cut back as was capital expenditure and, more important, plans for the future in respect of both these activities were curtailed in Canada.

Mining is a cyclical business and subject to undue pessimism or overoptimism but experience since World War II obviously teaches that expanding world populations and industrial growth will sustain a rising demand for mining products. Recognition of this trend should allow a reasonably balanced view to be taken of future investment; but against this background it would appear that in Canada the mining industry has pulled in its horns further than seems justified.

The elements that underlie the situation have been discussed frequently but they bear repeating because their combined effect has fostered, intentionally or otherwise, an unfavorable climate for mining investment in Canada.

There is no doubt that the drawn-out debate on the new taxation legislation created uncertainty and the enacted results created less favorable prospects for the future. At the same time, prospective changes in the Labour Code and the Competition Act appeared to have been brought forward with little concern for their impact on the mining industry.

At the provincial level, proposals for additional royalty revenues caused concern, not so much because the industry is unwilling to help meet a larger share of the general tax burden but because, again, views propounded have appeared hostile or ill-considered or both.

During the Federal election major mining companies came under attack for having made use of government grants and subsidies and were accused of having mulcted somehow the national heritage. This latter issue seemed to be associated with the matter of foreign control. In an industry which is essentially internationally oriented, both technologically and financially, much of this debate sounds unreal.

Finally, implementation of laws to protect the environment, while causing an immediate financial burden on the industry, has introduced uncertainty for the longer term in the sense that the discussion on environmental problems has become connected, inter alia, with a theory of conservation that appears to ascribe value only to metals and minerals that are left in the ground.

We recognize, of course, that all these issues form part of a wide debate in which the country as a whole is seeking to define its attitude toward a number of fundamental value problems that have hitherto been interpreted in terms of conventional private enterprise. The mining industry is able and willing to contribute to finding solutions in the areas in which it is affected but right solutions are not likely to be achieved if the industry is regarded as a free-for-all where provincial ambitions and federal theories can be reconciled on an unrealistic basis with political impunity.

The facts of the matter are that mining is a very high-risk business and investment tends to be undertaken in a system that is certain enough to allow the prospect of adequate rewards. If investors begin to think that the future is likely to become excessively restrictive or unsettled there is an obvious danger that the Canadian mining industry will retrogress and this is undesirable in terms of employment, foreign exchange, technology and most important perhaps the expansion of the country's industrial frontiers.

Earnings

Earnings for 1972 before extraordinary items were $11,379,312, or $1.26 per share. Net earnings, after providing for the estimated loss on the Wellgreen Mine, were $2,861,312, a slight decrease from earnings of $3,008,977 in 1971. Earnings per share were 32¢ and 33¢, respectively.

An amount of $9,407,000 was provided in the second quarter to meet the estimated Wellgreen loss but since production in 1972 was greater than anticipated, the provision for loss has been reduced to $8,518,000.

A comparison with 1971 results is difficult because of the effect on 1971 earnings of the five-month strike that shut down the base-metal operations in Flin Flon and Snow Lake. However, significant factors affecting earnings in 1972 were the impact on costs of the 1971 wage settlement and the relatively weak copper prices.

Comparative financial summary

	1972	1971
Operating revenue . . .	$107,843,689	$ 60,606,500
Interest, other income	2,783,835	2,148,263
Net earnings	2,861,312	3,008,977
Working capital	47,821,208	40,786,511
Marketable securities .	2,541,190	2,541,190
Investments in other companies	12,442,064	10,853,809
Long-term debt	27,778,000	28,354,000
Retained earnings . . .	98,142,261	102,514,095
Earnings per share . .	.32	.33
Dividends per share .	.80	.50

Dividends

Dividends declared for 1972 totalled $7,233,146, equivalent to 80¢ per share, compared with $4,520,417, or 50¢ per share, in 1971.

Financial

Capital expenditures during 1972 totalled $12,280,000, of which $6,802,000 were spent in the Flin Flon-Snow Lake areas, principally on underground mine development. Other significant expenditures were $1,808,000 by Francana Oil & Gas Ltd., and $1,506,000 by the Sylvite of Canada potash division.

The entire construction and mine development program was financed by internally generated funds and, in addition, cash reserves were increased substantially during the year. As a result, the company is in a strong position to finance the modernization and environmental programs being implemented in the Flin Flon metallurgical complex.

These programs, together with normal annual capital outlays, require estimated capital expenditures of $23,000,000 in 1973.

The investment portfolio of stocks in Canadian companies remained unchanged from a year ago. The market value of the stocks was $1,955,000 at year-end, $586,000 less than cost. During the year, the Company sold its 38% shareholding interest in Tombill Mines Limited for $1,572,000 in cash.

On September 30, 1972, a portion of the investment in preferred shares of Francana Oil & Gas Ltd. was converted into 30,000 Francana common shares.

Working capital increased from $40,787,000 at the end of 1971 to $47,821,000 at year-end 1972.

Ore reserves

Flin Flon-Snow Lake area: Proven reserves of copper-zinc ore in the Company's mines at year-end totalled 17,283,600 tons, assaying Au, 0.037 oz. per ton; Ag, 0.57 oz. per ton; Cu, 2.95%; and Zn, 3.3%. Ore reserves at year-end 1971 totalled 18,344,900 tons.

South Saskatchewan area: Proven reserves of potash ore at the Company's Sylvite of Canada Division, near Rocanville, totalled 311,000,000 tons at year-end.

In addition Francana Oil & Gas Ltd., in which the Company has a 52.5% interest, had proven reserves of natural gas totalling 84.1 billion cubic feet at year-end, compared with 73.9 billion cubic feet at year-end 1971. Proven reserves of crude oil totalled 15,422,000 barrels, virtually unchanged from the total at year-end 1971.

Prices

At the beginning of 1972 the price of copper on the LME was 43.44¢ (Can.) per lb. and climbed to a peak of 52.87¢ in early March, then gradually declined to 47¢ by the middle of June. During the balance of the year the price remained relatively constant and was 47.7¢ at year-end.

The U.S. producer price was 50.5¢ (U.S.) at the start of the year and increased to 52.5¢ in February, then dropped back to 50.5¢ in July, where it remained for the balance of the year. The Canadian price was very close to the U.S. price, the differences reflecting the exchange rate.

At the start of the year, the base price for zinc in both Canada and the U.S. was 17¢ per lb. It rose to 19¢ at the end of April and added an additional ½¢ per lb. early in December.

Demand for cadmium exceeded supply by a wide margin in 1972 and the result was a doubling of the price, from $1.50 (Can.) per lb. at the beginning of the year to $3 late in the year.

The price of gold rose from $43.92 (Can.) per oz. at the beginning of the year to $64.62 at year-end.

The Handy & Harman price for silver was $1.38 (Can.) per oz. at the start of the year and rose to $2.03 by year-end in response to stronger demand in the market.

Markets

The strong demand for zinc in 1972 throughout North America resulted in the following significant changes in the geographic distribution of the Company's sales (1971 percentages in brackets): domestic — 45% (39%); U.S. — 42% (25%); overseas — 13% (36%).

There were only minor changes in the geogra-

phic distribution of copper sales: domestic — 27% (31%); overseas — 73% (69%).

Sales of potash were distributed geographically as follows: domestic — 7% (5%); U.S. — 45% (60%); overseas — 48% (35%).

Shareholders

On December 31, the number of shareholders of record was 14,254, compared with 15,476 at year-end 1971. There were 11,018 shareholders of Canadian registry, holding 86.6% of the outstanding shares.

Labor relations

Significant developments in labor-management relations took place during 1972 in a number of programs developed by the newly established Industrial Relations Department. These included monthly labor-management meetings, supervisory training in employee relations and increased emphasis on employee training programs and on public relations. The broadened scope of activities is directed by an industrial relations manager with the assistance of the personnel manager and the training officer.

During the year, the Pension Plan Study Committee, comprising union and Company representatives, reached agreement on the terms of a new company-financed pension plan for all hourly rated employees.

The present contracts with the United Steelworkers of America, the International Union of Operating Engineers and the Association of Flin Flon Trade Unions, which represents seven unions, expire on September 30, 1973. It is expected that negotiations for a new contract will begin early in the third quarter of 1973.

Environment

More than $6,000,000 will be spent during the next two years to comply with the Manitoba ambient air quality regulations and to improve the air quality in the smelter work areas. The provincial standards will be met by constructing an 825-foot stack to improve the dispersion of sulphur dioxide from our metallurgical facilities. Particulate emissions, which have always been low, will be further reduced and smelter-flue revisions with increased gas-handling capabilities will improve the atmosphere in the smelter work areas. A continuing research program is maintained to develop treatment methods that will minimize the impact of our operations on the total environment in the Company's mining and industrial areas.

General

Exploration was carried out by Hudson Bay Exploration and Development Company Limited on its own behalf in Manitoba and Saskatchewan and jointly with Anglo American Corporation of Canada Limited in British Columbia, Yukon, Ontario, Quebec and in the southwestern U.S. Beaver Exploration Company, a wholly owned U.S. subsidiary, was reactivated and an office was opened in Tucson, Arizona. Diamond-drilling on all Canadian projects totalled 182,257 feet and tested 397 geophysical anomalies. In addition to the above total, 34,214 feet were drilled to investigate further the Stikine Copper Limited property in northwestern British Columbia.

Two new mines, White Lake Mine and Ghost Lake Mine, were brought into production in the Flin Flon-Snow Lake area during the year. One mine, Flexar Mine, ceased production, its ore reserves having been depleted. Development of Centennial Mine, a copper-zinc orebody discovered nine miles southeast of Flin Flon, will be started in 1973. The orebody contains approximately 1.4 million tons of 2.06% copper and 2.6% zinc to the 1,200-foot level and is still open at depth. The Company at present operates nine base-metal mines in the Flin Flon-Snow Lake area. No decision has yet been made to develop to production the Wim Mine (1.09 million tons, 2.91% copper) in the Flin Flon - Snow Lake area. The Wim Mine's reserves are included in the Company's total ore reserves, but the tonnages of the following undeveloped properties are not: Reed Lake Zone (1,142,000 tons, 2.18% copper), Rail Lake Zone (325,000 tons, 3% copper), Hudvam Mines Ltd. (drill-indicated reserve of 401,200 tons, 1.5% copper, 1.7% zinc, 0.12 oz. per ton gold, 0.43 oz. per ton silver), all in the Flin Flon-Snow Lake area; the Tom Claims in the Yukon (8,645,000 tons, 2.75 oz. per ton silver, 8.4% zinc and 8.1% lead).

Programs implemented during 1972 to increase the efficiency and productivity of operations in the Flin Flon-Snow Lake area have produced encouraging results. A more effective use of manpower has been achieved in a planned maintenance program, engineering studies of production facilities have pinpointed areas where costs can be reduced and a study of materials management is expected to result in a reduction of inventory and improved materials handling and purchasing. The Company increased its production of blister copper from its own ores by 8% in 1972, compared with production in 1970 (the Flin Flon operations were shut down by a strike for five months in 1971). The Company's

present policy is not to increase the output of blister copper from its own ore resources beyond 8%. However, as the result of improvements in metallurgy in the smelter operations, throughput of concentrates was increased by 17%, compared with 1970 figures. The additional capacity was used to treat concentrates either purchased from other companies for our own account or smelted on a toll basis.

Sylvite of Canada, the Company's potash division, trimmed its production schedule during the last half of the year. Inventory had increased because of the dock strike in Vancouver and inclement weather in the U.S. Midwest prevented farmers from using as much fertilizer as they had planned. However, despite these setbacks and extremely competitive marketing conditions, Sylvite produced and shipped slightly more tonnage than in 1971. Higher prices and increased consumption have been predicted for 1973 but there could well be difficulty in obtaining sufficient railway cars to move product to customers when they need it most. Moreover, production of potash is still controlled by the Saskatchewan government's prorationing regulations. Sylvite continued to operate at a profit, primarily because of its extremely efficent continuous mining method and automated refinery operation. Barring unforeseen disruptions in the marketplace, Sylvite will continue to contribute to the Company's earnings.

Terra Chemicals International, Inc., of Sioux City, Iowa, a U.S. fertilizer manufacturer in which the Company holds a 15% interest plus options to convert preferred shares to common for a further 10%, is the exclusive sales agent in the U.S. for Sylvite of Canada's potash. Terra is well placed to benefit from the expected increase in demand for fertilizer products during the next few years. One of the major reasons is that Terra has a firm contract for its supply of natural gas, the basic feedstock for producing nitrogen fertilizers, whereas the developing shortage of that fuel in the U.S. will prevent expansion and curtail production by many other manufacturers. With Canada and the U.S. again being regarded as the breadbasket of the world, the fertilizer industry should become more profitable and Terra expects its own net profit for 1973 to be considerably higher than it was for 1972.

The Company's oil and gas wing, Francanà Oil & Gas Ltd., which is 52.5%-owned by the Company, increased its gross income by 14% in 1971 and expects a further increase of approximately 15% in 1973. The anticipated increase for 1973 flows from increases in the posted field prices for crude oil plus the additional revenue from new wells going on stream. Francana holds a 22% shareholding interest in Trend Exploration Limited, of Denver, which has discovered oil in the West Irian area of Indonesia. It's hoped that production will begin in the fall of 1973 at an initial rate of 30,000 barrels per day. Trend holds a 27% interest in the 1.1 million-acre production-sharing contract with the Indonesian Government and acts as operator for the consortium formed to develop the property. In the Arctic, Panarctic Oils Limited was still drilling a test well, Gemini E-10, at year-end on Ellesmere Island on land in which Francana has a 15% net working interest. Panarctic has not yet released any information on Gemini E-10, which is only 11 miles northeast of Romulus C-42, the site of an interesting oil discovery that was announced on February 24, 1972.

Production at Whitehorse Copper Mines Ltd., in which both the Company and Anglo American Corporation of Canada Limited have an equity interest, was resumed on December 18 following completion of development of the Little Chief and Middle Chief orebodies for underground mining. Production had been suspended since June, 1971, and both the Company and Anglo American participated in refinancing the development program. Ore production is at the rate of approximately 2,300 tons per calendar day, grading just over 2% copper. Underground drilling has indicated the possibility that ore reserves may be increased at depth. The profit prospects of Whitehorse Copper Mines have brightened considerably in view of the firmer price of copper and of the recent arrangements to sell the copper concentrates. The Company and Anglo American will share equally one third of any profits realized from the operation during and after repayment of debt.

More underground ore than was expected is being recovered from the Wellgreen Mine of Hudson-Yukon Mining Co., Limited, scheduled to be closed permanently early in 1973 because of lack of continuity in the orebody. The additional revenue of $889,000 realized to the end of 1972 will enable the Company, which owns 96% of the outstanding shares of Hudson-Yukon and financed the entire operations, to reduce the $9.4 million loss declared at midyear to $8,518,000. The loss was charged against consolidated earnings as an extraordinary item in the quarter ended June 30, 1972. Production at the Wellgreen began on May 1,

1972, at the rate of approximately 500 tons per calendar day. Operations will continue until the recoverable ore underground and the tonnage stockpiled have been treated in the concentrator.

On May 1, 1972, the Company entered into an agreement with Kennecott Copper Corporation and Cominco Ltd., whereby the Company has up to five years to manage and direct a drilling, engineering and economic evaluation program on their jointly owned Stikine Copper Limited property in northwestern British Columbia. In return for expenditures incurred during the first stage of the program, the Company can, by taking down Stikine treasury shares, increase its present 19% interest in Stikine to 32.9%; Cominco has elected to maintain its present interest at 5%. Kennecott will not provide any funds and thus its 76% interest will be reduced accordingly. If Stikine decides to proceed with development of the property to production, then, according to the second stage of the agreement, the Company has the right to increase its interest to 45% by taking down more Stikine treasury shares for additional expenditures. Fifty-one diamond drill holes were completed in 1972 for a total of 34,214 feet. All the holes, except one, were drilled to fill in between widely spaced holes that were drilled previously in the south half of the Central Zone. Estimates for the south half of the Central Zone total 59 million tons averaging 1.2% copper of drill-indicated reserves, plus an additional 45 million tons averaging 1% copper of drill-inferred reserves in the north half of the Central Zone. Although the tonnage and grade is impressive for a porphyry-type copper deposit, the viability of the project will depend to a great extent on solving the problems of establishing a suitable infrastructure. At present the area is accessible only by helicopter. A field engineering reconnaissance program to assess the magnitude of the problems was conducted during the summer of 1972. Drilling and field engineering studies will be resumed in the summer of 1973. The total cost of both programs in 1972 was $750,000, the drilling program accounting for nearly all the expenditure.

Work continued during the year on various aspects of the Baffinland Iron Mines Limited's project. The ultimate viability of the project will depend to a great extent on the solution of shipping problems and on whether supra-economic support on a large scale from the Government of Canada can be justified for the establishment of an appropriate infrastructure.

Appointments
During the year D. J. Robertson retired. He had been General Manager at Flin Flon since 1969. We would like to thank him for 39 years of devoted service to the Company. He was succeeded by J. Robert G. Sadler.

Outlook
The profitability of the Company depends primarily on the price of its two main products — copper and zinc. The strengthening of the copper price early in 1973, the continuing strong zinc price, the improved prospects for potash and the benefits of the relative devaluation of the Canadian dollar will help to offset the heavy cost increases which the Company has faced in recent years.

However, prices and relative currency values are not issues over which for the most part the industry has a great deal of control. Our competitive position in world mining will be most soundly assured not by high prices but by a sympathetic domestic environment which recognizes the high-risk nature of prospecting and mining development and actively encourages investment in the Canadian mining industry.

Appreciation
Significant progress was made during the year toward achieving higher efficiencies and productivity and on behalf of the Board we extend our sincere appreciation and thanks to management and all employees for their loyalty and co-operation.

On behalf of the Board of Directors

Chairman

W. A. Morrice

March 21, 1973

President

Consolidated statement of financial position

as at December 31, 1972

The accompanying notes are an integral part of the financial statements.

Hudson Bay Mining and Smelting Co., Limited and subsidiary companies

	1972	1971
Current assets		
Cash	$ 301,681	$ 362,043
Short-term securities	20,895,400	14,070,000
Accounts receivable	17,087,999	11,084,565
Inventories (note 3)	25,398,245	21,755,088
Materials and supplies — at cost	6,309,262	6,369,015
Total current assets	69,992,587	53,640,711
Deduct:		
Current liabilities		
Accounts payable and accrued liabilities	18,574,020	10,530,563
Income and other taxes payable	1,213,073	843,554
Dividend payable	1,808,286	904,083
Current portion of long-term debt	576,000	576,000
Total current liabilities	22,171,379	12,854,200
Working capital	47,821,208	40,786,511
Add:		
Marketable securities — at cost		
(Market value 1972 — $1,955,469; 1971 — $1,953,594)	2,541,190	2,541,190
Investments in other companies — at cost		
Quoted (Market value 1972 — $546,500; 1971 — $1,439,421)	1,479,149	3,564,269
Unquoted	18,367,810	15,281,390
	19,846,959	18,845,659
Less provision for future write-offs	7,404,895	7,991,850
	12,442,064	10,853,809
Property, plant and equipment (note 4)	89,350,948	100,391,128
Other assets		
Unamortized mine development expenditures (note 5)	37,717,772	42,688,375
Sundry assets and deferred charges — at cost	4,386,912	5,541,520
	42,104,684	48,229,895
Capital employed	194,260,094	202,802,533
Deduct:		
Long-term debt (note 6)	27,778,000	28,354,000
Deferred income taxes (note 7)	16,687,000	19,987,000
Minority interests in subsidiaries	5,716,477	6,021,912
	50,181,477	54,362,912
Shareholders' investment	$ 144,078,617	$ 148,439,621
Investment evidenced by		
Capital stock (note 8)		
Authorized — 12,000,000 shares of no par value		
Issued and fully paid — 9,041,433 shares	$ 45,936,356	$ 45,925,526
Retained earnings	98,142,261	102,514,095
Total shareholders' equity	$ 144,078,617	$ 148,439,621

Approved by the Board of Directors
Director: Gavin W. H. Relly
Director: W. A. Morrice

Consolidated statement of earnings

for the year ended December 31, 1972

The accompanying notes are an integral part of the financial statements.

Hudson Bay Mining and Smelting Co., Limited and subsidiary companies

	1972	1971
Revenue		
Sales of product	$ 107,843,689	$ 60,606,500
Less freight, refining and selling expenses	11,967,251	6,946,619
	95,876,438	53,659,881
Interest and other income (note 9)	2,783,835	2,148,263
	98,660,273	55,808,144
Costs and expenses		
Production costs	63,485,080	37,801,452
Amortization of mine development expenditures	6,882,065	3,796,088
Depreciation and depletion	6,557,975	4,559,887
Exploration expenses	2,759,016	3,045,171
General administrative expenses	2,292,265	2,303,833
Interest and other long-term debt expense	2,535,224	1,272,819
	84,511,625	52,779,250
Income taxes and provincial mining taxes		
Income taxes	927,000	(1,330,000)
Provincial mining taxes	1,572,566	125,858
	2,499,566	(1,204,142)
Earnings from operations	11,649,082	4,233,036
Other deductions		
Provision for future write-offs of investments	—	812,500
Earnings before minority interests	11,649,082	3,420,536
Minority interests in earnings of subsidiaries	269,770	411,559
Earnings before extraordinary item	11,379,312	3,008,977
Estimated loss on investment in Wellgreen Mine		
(less applicable income tax reduction $4,847,000) (note 11)	8,518,000	—
Net earnings for the year	$ 2,861,312	$ 3,008,977
Earnings per share		
Before extraordinary item	$ 1.26	$ 0.33
After extraordinary item	$ 0.32	$ 0.33

Consolidated statement of retained earnings

	1972	1971
Retained earnings at beginning of the year	$ 102,514,095	$ 104,025,535
Net earnings for the year	2,861,312	3,008,977
	105,375,407	107,034,512
Dividends		
80¢ per share (1971 — 50¢)	7,233,146	4,520,417
Retained earnings at end of the year	$ 98,142,261	$ 102,514,095

Consolidated statement of source and application of funds

for the year ended December 31, 1972

The accompanying notes are an integral part of the financial statements.

Hudson Bay Mining and Smelting Co., Limited and subsidiary companies

	1972	1971
Source of funds		
Operations:		
Earnings from operations	$ 11,649,082	$ 4,233,036
Depreciation, depletion and amortization of mine development expenditures	13,440,040	8,355,975
Deferred income taxes	1,547,000	(2,809,000)
	26,636,122	9,780,011
Contribution from Wellgreen operations	1,062,972	—
	27,699,094	9,780,011
Proceeds from long-term debt	—	29,000,000
Sale of investment	1,571,580	—
Issue of shares under options	10,830	—
Decrease in sundry assets	1,154,608	(828,860)
	30,436,112	37,951,151
Application of funds		
Dividends	7,233,146	4,520,417
Investments in other companies	3,159,835	1,608,645
Additions to property, plant and equipment	6,232,573	15,470,625
Mine development expenditures	6,049,893	6,507,445
Reduction of long-term debt	576,000	646,000
Decrease in minority interests	149,968	358,967
	23,401,415	29,112,099
Increase in working capital	7,034,697	8,839,052
Working capital at beginning of the year	40,786,511	31,947,459
Working capital at end of the year	$ 47,821,208	$ 40,786,511

Notes to the consolidated financial statements

Hudson Bay Mining and Smelting Co., Limited and subsidiary companies

December 31, 1972

1. Principles of consolidation

The consolidated financial statements include the accounts of Hudson Bay Mining and Smelting Co., Limited and of all its subsidiaries.

2. Foreign exchange

Foreign currencies have been translated to Canadian dollars as follows: revenue and expenditures, non-current assets and liabilities at rates in effect at dates of transactions; current assets and liabilities at rates in effect at the end of the year.

3. Inventories

Inventories comprise the following:

	1972	1971
Metals, at estimated sales value	$ 17,807,215	$ 14,877,534
Metals in process, at cost	2,027,774	1,648,181
Manufactured and other products (finished, in process and raw materials), at cost or net realizable value, whichever is the lower	5,563,256	5,229,373
	$ 25,398,245	$ 21,755,088

4. Property plant and equipment

(a) The following is a summary of property, plant and equipment at cost by major category. These costs were reduced during 1972 by the write-off of the assets of the Wellgreen Mine.

	1972	1971
Mineral properties	$ 19,410,140	$ 22,555,867
Base-metal plant and equipment	77,839,926	82,716,577
Industrial mineral plant and equipment	45,402,181	43,971,643
Oil and gas properties, plant and equipment	24,138,188	22,333,483
Other property, plant and equipment	8,040,694	7,735,764
Total cost	174,831,129	179,313,334
Less accumulated depreciation and depletion	85,480,181	78,922,206
	$ 89,350,948	$100,391,128

Mineral properties include all exploration costs with respect to mines operating or in the development stage. Oil and gas properties are accounted for on the full-cost basis whereby all costs relating to the exploration for and development of oil and gas resources are capitalized whether productive or unproductive.

(b) Depreciation of base-metal plant and equipment and depletion of mineral and oil and gas properties are charged to operations by the unit of production method based on estimated recoverable reserves. Depreciation on industrial mineral and other plant and equipment is charged to operations on a straight-line basis over the estimated useful lives of the plant and equipment.

5. Amortization of mine development expenditures

Mine development expenditures are charged to operations on a unit-of-production basis based on estimated recoverable reserves. Unamortized mine development expenditures were reduced during 1972 by the write-off of the development costs of the Wellgreen Mine.

6. Long-term debt

Long-term debt comprises the following:

	1972	1971
9% unsecured debentures maturing June 15, 1991	$ 25,000,000	$ 25,000,000
Bank production loans of subsidiary, Francana Oil & Gas Ltd.	3,354,000	3,930,000
	28,354,000	28,930,000
Less amount included in current liabilities	576,000	576,000
	$ 27,778,000	$ 28,354,000

(a) Under the trust indenture covering the 9% unsecured debentures, sinking-fund payments sufficient to retire $800,000 of principal amount each year from 1977 to 1990 inclusive are required. The Company has the option to redeem the debentures at prices ranging downward from 108.45% currently to 100% in 1989 and thereafter. Debentures redeemed through the operations of the sinking-fund are callable at par.

(b) The production loans are repayable in monthly instalments of $48,000, plus interest at rates approximating prime bank rate. The loans are secured by an assignment of the subsidiary's interest in certain producing properties.

7. Deferred income taxes

Deferred income taxes represent tax reductions for expenditures on mine development, mineral and oil properties, cost of participation in certain mining companies, and depreciation deducted in the determination of taxable income but not charged to earnings. The reduction in deferred income taxes in the current year results from the loss on the investment in the Wellgreen Mine.

8. Share option plan

Under the Company's Share Option Plan for Full Time Officers and Key Employees, 168,000 unissued shares were reserved for granting of options at prices not less than 95% of the market value (full market value in the case of United States citizens) on the day the option is granted.

During 1972 options were granted for 81,365 shares (officers 15,940 shares) and options for 42,375 shares granted in 1970 were terminated. Options were exercised in respect of 600 shares granted in 1968 for which the Company received $10,830 cash.

As of December 31, 1972, 6,010 shares were available for future grants and 86,390 shares were subject to outstanding options as follows:

Date of Grant	Option Price Per Share	Shares For Officers	Total Shares
January 23, 1970	$27.01	750	5,025
December 14, 1972	$19.65	15,940	81,365

The options granted in 1970 are exercisable until January 22, 1975, and the options granted in 1972 are exercisable from January 23, 1975, to December 13, 1977.

9. Interest and other income

This amount includes interest on short-term securities, sales of power, revenue from custom treatment of concentrates, and miscellaneous investment income.

10. Operations in 1971

The mining and metallurgical operations at Flin Flon and Snow Lake were shut down by a strike from January 27 to June 21.

11. Extraordinary item

The Wellgreen Mine in the Yukon, entirely financed by the Company, came into production in May, 1972, and will be closed early in 1973.

It is estimated that of the total investment in this property an amount of $8,518,000, which is net of an applicable tax reduction of $4,847,000, will not be recovered.

12. Pension fund

The unfunded past service pension liability at December 31, 1972, approximates $5,000,000 and is being funded over the next 16 years as recommended by the actuaries.

13. Remuneration of directors and officers

The Company has 10 directors and 11 officers; two of the officers are also directors. The aggregate remuneration paid to the directors and officers as such was as follows:

	1972	1971
Directors	$ 27,400	$ 30,733
Officers	$ 578,194	$ 585,291

Auditors' report

To the shareholders of
Hudson Bay Mining and Smelting Co., Limited:

We have examined the consolidated statement of financial position of Hudson Bay Mining and Smelting Co., Limited and subsidiary companies as at December 31, 1972, and the consolidated statements of earnings, retained earnings and source and application of funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion these consolidated financial statements present fairly the financial position of the companies as at December 31, 1972, and the results of their operations and the source and application of their funds for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Deloitte, Haskins & Sells
Chartered Accountants

Toronto, Canada, February 19, 1973.

Ten-year record 1963-1972

ore milled and ore reserves

year	milled (tons)	reserves (tons)	copper (%)	zinc (%)	gold (oz./ton)	silver (oz./ton)
1963	1,619,000	15,115,500	2.9	4.7	0.05	0.8
1964	1,585,000	16,627,400	3.0	4.3	0.05	0.8
1965	1,640,000	16,842,400	3.0	4.5	0.05	0.8
1966	1,690,000	16,765,300	2.9	4.4	0.04	0.7
1967	1,588,000	16,884,600	3.0	4.1	0.04	0.7
1968	1,610,000	17,612,300	3.0	3.8	0.04	0.6
1969	1,702,000	18,048,600	3.0	3.5	0.04	0.6
1970	1,709,000	19,115,100	2.9	3.3	0.04	0.6
1971	1,084,000	18,344,900	2.9	3.3	0.04	0.6
1972	1,847,900	17,283,600	2.9	3.3	0.04	0.6

production

year	copper (tons)	zinc (tons)	cadmium (lbs.)	gold (ozs.)	silver (ozs.)	selenium (lbs.)
1963	37,301	79,596	316,050	83,878	1,167,160	77,429
1964	40,417	71,012	329,552	80,174	1,179,888	70,335
1965	39,726	71,435	368,208	82,189	1,215,359	62,061
1966	38,268	73,331	352,405	71,202	1,022,009	76,602
1967	38,403	72,061	352,042	70,615	1,040,098	63,316
1968	41,660	80,308	330,872	59,602	970,674	86,346
1969	42,302	79,711	333,959	52,410	818,209	91,866
1970	42,178	78,622	338,343	55,188	865,141	89,808
1971	26,988	41,158	145,857	27,635	504,021	61,872
1972	54,076	77,023	386,768	51,990	1,014,041	65,828

earnings and dividends

year	operating revenue	interest, other income	net earnings	earnings per share	dividends	dividends per share
1963	$51,224,671	$1,252,771	$11,737,063	$1.42	$ 8,963,412	$1.08⅓
1964	56,377,535	1,435,381	13,095,323	1.58	9,652,905	1.16⅔
1965	61,702,298	1,486,058	15,990,045	1.93	10,342,399	1.25
1966	69,112,153	1,454,342	19,116,388	2.31	11,169,791	1.35
1967	72,351,946	1,612,232	16,718,617	1.98	10,999,845	1.30
1968	79,699,926	1,965,946	21,134,880	2.47	11,551,067	1.33⅓
1969	95,674,349	2,238,424	29,698,514	3.29	13,252,815	1.46⅔
1970	87,160,970	1,765,199	19,563,052	2.16	10,698,234	1.18⅓
1971	61,606,500	2,148,263	3,008,977	0.33	4,520,417	0.50
1972	107,843,689	2,783,835	2,861,312 *	0.32*	7,233,146	0.80

* Net earnings before extraordinary item were $11,379,312 ($1.26 per share)

Properties, subsidiary companies and major holdings

Location maps

wholly or partly owned Canadian properties of Hudson Bay Mining and Smelting Co., Limited

Map of Canada

1 Hudson-Yukon Mining Co. Limited
2 Stikine Copper Limited
3 Baffinland Iron Mines Limited
4 Churchill River Power Company Limited
5 Francana Minerals Ltd.
6 Francana Oil & Gas Ltd.
7 Sodium Sulphate (Saskatchewan) Ltd.
8 Sylvite of Canada
9 Manitoba Chromium Limited
10 Hudson Bay Diecastings Limited
11 Zinc Oxide Company of Canada Limited
12 Zochem Limited

Map of Flin Flon / Snow Lake Area

a Centennial Mine
b Flin Flon Mine
c White Lake Mine
d Schist Lake Mine
e Flexar Mine
f Wim Mine
g Anderson Lake Mine
h Chisel Lake Mine
i Dickstone Mine
j Ghost Lake Mine
k Stall Lake Mine
l Osborne Lake Mine

Metals division

Production

Metal production during 1972 was as follows: refined copper, 108,152,116 lbs.; slab zinc, 154,046,774 lbs.; cadmium, 386,768 lbs.; selenium, 65,828 lbs.; gold, 51,990 ozs.; and silver, 1,014,041 ozs.

Also produced and sold were 332 tons of lead concentrates containing 84 ozs. of gold, 10,494 ozs. of silver, and 409,810 lbs. of lead.

Producing mines

The Company operates nine mines in the Flin Flon - Snow Lake area: seven produced continuously during the year, two started producing, and one was closed after its ore reserves were depleted.

Ore production totalled 1,845,800 tons, an increase of 763,100 tons over the tonnage mined in 1971 when operations were shut down by a five-month strike.

Details of this production, with average assays, are as follows:

		average assays				
mine	tons	Au oz./ton	Ag oz./ton	Cu %	Zn %	Pb %
Flin Flon	469,300	0.06	0.9	1.9	3.3	—
Anderson	351,400	0.02	0.2	3.8	—	—
Chisel	209,100	0.04	0.9	0.9	9.3	0.3
Osborne	227,400	—	0.1	3.4	1.8	—
Dickstone	258,600	0.01	0.4	2.5	3.3	—
Flexar	56,900	0.06	0.3	3.2	0.5	—
Schist	110,200	0.03	0.8	4.3	4.3	—
Stall	44,600	0.08	0.6	4.9	1.2	—
White	82,500	0.02	0.9	1.9	4.4	—
Ghost	35,800	0.03	1.2	1.8	9.4	0.3

In the Flin Flon Mine, pillars and remnants continued to be the main sources of ore and accounted for 90% of its production.

Production was normal during the year at the Schist Lake Mine with exploration concentrated in the area below the old Mandy Mine. Extensive exploration drilling indicated only a small ore zone of little importance.

Flexar Mine ceased producing in October, its ore reserves having been depleted.

White Lake Mine commenced production on June 15, 1972, and operated as planned.

Molten blister copper flows from copper converter in metallurgical complex at Flin Flon, Manitoba.

At the Dickstone Mine, oxidation of the broken ore in the stopes caused some concern and a more expensive mining method had to be used; however, no production was lost. Some exploration drilling below the bottom level in No. 1 zone indicated an additional 85,000 tons of ore for a total of 150,000 tons below the bottom level.

Development continued at the Ghost Lake Mine and production started in August. Stockpiled development ore provided half the tonnage treated.

Production at the Chisel Lake Mine was reduced when Ghost Lake Mine started up but the combined zinc grade was improved by about 10%.

The sinking of the internal shaft was completed at the Stall Lake Mine. Installation of shaft equipment was started and will be followed by the driving of four new levels. Production from the upper levels was limited because of the new development. The 1,950-foot level exploration drift was completed after advancing approximately 6,000 feet and a small orebody was found at the extremity of the Company's property.

Osborne Lake Mine produced as planned and the No. 2 shaft will be deepened in 1973 to develop the ore zone below the 2,100-foot level.

Poor ground conditions at the Anderson Lake Mine required a change in mining methods from open stoping to cut-and-fill stoping. This necessitated a more elaborate mine-filling system with facilities for a surface fill stockpile. Mine production continued on a seven-day-per-week basis.

The lack of continuity of ore and poor ground conditions at the Wellgreen Mine in the Yukon made it impossible to establish a mining method that would sustain a continuous and profitable extraction program. The mine will be closed early in 1973 when the recoverable ore underground and the stockpile tonnage have been put through the concentrator.

Mines under development

There were no new mines being developed at year-end.

Development of the Centennial Mine, 20 miles southeast of Flin Flon, will be started in 1973.

Exploration

Exploration work commitments were fulfilled in 1972 on a small gold-copper property at Vamp Lake, 30 miles northeast of Flin Flon. This property could be

economically viable at some time in the future; the property is held by a newly incorporated company, Hudvam Mines Limited, 80%-owned by Hudson Bay Exploration and Development Company Limited.

A copper zone was discovered during diamond-drilling of electromagnetic anomalies at Barrington Lake, 26 miles east of Lynn Lake, Manitoba. The drilling outlined a small reserve which is not economic at present. Exploration of the Company's extensive holdings in this area will be continued in 1973.

At Batty Lake, 52 miles east of Flin Flon, drilling of a copper zone discovered in 1971 has been sufficiently encouraging to warrant further investigation in 1973.

Structural drilling 2,000 feet southwest of Anderson Lake Mine in the Snow Lake area has encountered significant copper mineralization that merits further investigation by surface or underground exploration.

Options were taken by the Company on six properties during 1972 and at year-end 12 options continued in good standing. Five options were dropped; one option, the Vamp Lake option, was exercised and Hudvam Mines Limited was incorporated.

Hudson Bay Air Transport Limited, a wholly owned subsidiary of the Company, flew 1,993 hours, or 218,845 miles, largely in support of exploration programs.

Concentrator

It was decided to replace tertiary crushing with rod mills and installation was started late in the year. This will allow a 15% increase in ore throughput.

The concentrator treated 1,847,903 tons of ore in 1972. This represented 6,831 tons per operating day, the highest daily tonnage in the history of the concentrator.

The contribution of ores from the various mines was as follows: Flin Flon Mine, 26%; Osborne Lake Mine, 12%; Chisel Lake Mine, 11%; Stall Lake Mine, 2%; Flexar Mine, 3%; Schist Lake Mine, 6%; Anderson Lake Mine, 19%; Dickstone Mine, 14%; Ghost Lake Mine, 5%; and White Lake Mine, 2%.

Ore treated and the average assays:

	1972	1971*
tons of ore treated	1,847,900	1,084,000
average tons per calendar day	5,049	4,930
Au — oz. per ton	0.03	0.03
Ag — oz. per ton	0.6	0.5
Cu — %	2.7	2.8
Zn — %	3.3	3.2
Pb — %	0.2	0.2

* Operations were shut down for five months by a strike.

White Lake Mine, in the Flin Flon area, was brought into production on June 15, 1972.

The following concentrates were produced from ore treated:

		assays				
concentrates	tons	Au oz./ton	Ag oz./ton	Cu %	Zn %	Pb %
copper	283,950	.13	2.5	16.4	4.2	.2
zinc	85,400	.04	1.0	.8	48.1	.4
lead	332	.26	30.0	.3	3.9	60.1

A total of 1,478,200 tons of flotation tailings was produced during the year. Of this amount, 808,400 tons were treated for partial recovery of gold and silver in the cyanide section.

There were 61,250 tons used for backfill at the Flin Flon and Anderson Lake Mines and the balance was stockpiled.

The total tonnage and approximate assays of the tailings stockpiled to date are as follows:

	assays					
tons	Au oz./ton	Ag oz./ton	Cu %	Zn %	S %	Fe %
52,031,100	0.02	0.3	0.2	0.7	23.1	26.4

Zinc refinery

A total of 154,046,774 lbs. of zinc was produced in 1972. This was 1.39% less per operating day than the production during the previous year.

The Special High Grade brand for the diecasting industry was 99.9975% pure zinc.

Cadmium production totalled 386,768 lbs., or 1,057 lbs. per operating day, compared with 715 lbs. per operating day in 1971.

The following materials were treated:

		assays			
	tons	Au oz./ton	Ag oz./ton	Zn %	Cu %
HBMS concentrates	87,832	.041	1.05	48.0	0.82
purchased concentrates	42,901	—	0.72	52.5	0.88
oxide	41,651	.004	0.60	60.4	0.95

Production of sulphide residue totalled 52,524 tons, of which 51,579 tons were delivered to the smelter. The remainder was stockpiled.

Oxide residue produced and stockpiled totalled 11,164 tons.

Inventory at year-end was 135,901 tons of sulphide residue and 275,208 tons of oxide residue.

A new shed to thaw concentrates has been completed and is operational. A concentrate unloading facility and zinc storage building were almost completed by year-end.

Copper smelter

The tonnages and assays of the materials which were treated in the smelter during 1972 are shown below:

		assays			
	tons	Au oz./ton	Ag oz./ton	Cu %	Zn %
HBMS concentrates	285,663	0.13	2.4	16.4	4.2
residues, etc.	70,284	0.13	3.2	3.0	24.6
custom concentrates	21,997	—	—	—	—
purchased concentrates	36,381	0.12	4.0	24.5	3.6

Checking a print-out of the automated process control system in the mill at Flin Flon are (l-r): General Manager J. R. G. Sadler, Mines Manager J. R. Bray and Metallurgy Manager J. E. Goodman.

The tonnage and metal content of blister copper produced for the Company's account and for shipment to the refinery were as follows:

	tons	Au-oz.	Ag-oz.	Cu-lbs.	Se-lbs.
Hudson Bay feed	46,381	50,298	913,192	91,827,533	156,017
purchased concentrates	8,516	3,830	123,082	16,861,793	
total Hudson Bay blister	54,897	54,128	1,036,274	108,689,326	

Zinc oxide recovered from the smelter-stack dust totalled 7,755 tons, assaying 26.6% zinc, 4.2% copper, 1.7% cadmium, 12.88% lead. This material was sent to the zinc refinery for treatment.

Slag treated in the fuming furnaces totalled 366,400 tons, yielding 33,896 tons of oxide. This oxide, containing 46,172,380 lbs. of zinc, was delivered to the zinc refinery for processing into slab zinc.

Two-inch-diameter tuyeres were installed on the No. 3 converter. All three converters have now been equipped with two-inch diameter tuyeres, effectively increasing the matte-handling potential of the converters.

Research

Engineering studies on the Sherritt Gordon pressure-leach process for recovery of zinc from zinc sulphide concentrates continued in 1972. The Jarosite process for recovery of zinc from zinc residues is being tested on a laboratory scale.

Environmental investigations included biological studies on the lakes in the Flin Flon area and continued work on test plots to find out whether mill tailings would support plant life. A pilot water-treatment plant was operated during the summer months, using Schist Lake Mine water, with favorable results.

Increased use of atomic absorption was undertaken in the analytical section, resulting in less work being done by classical wet analytical methods.

Beneficiation studies on White Lake, Ghost Lake and Whitehorse Copper ores were carried out, resulting in ore-dressing procedures being recommended for each ore.

Power supply

Churchill River Power Company Limited, a wholly owned subsidiary, and the Company's thermal plant in Flin Flon generated 743,630,500 kilowatt hours in 1972.

Precipitation over the entire watershed was average for the year; however, good rains in the Reindeer Lake watershed late in the year maintained the elevation of Reindeer Lake so that again there was a full reservoir at the beginning of the winter draw-down period.

Major projects

After considerable study, decisions have been made to proceed immediately with the following major projects:

1. Anode casting: This will be a further refinement to the copper process.
2. Reverberatory boilers: These boilers will replace the present outdated boilers with modern equipment in the copper smelter.
3. High stack: A new 825-foot stack will replace the present stacks serving the smelter and zinc plant.
4. Smelter flue system: This entails revamping and replacing the present flue system from the converters, roasters and reverberatory furnace.

Personnel and administration

Action taken during the year to expand present activities and increase efficiency included the addition of two new senior staff personnel: Industrial Relations Manager and Projects Manager; both positions were filled by applicants outside the Company.

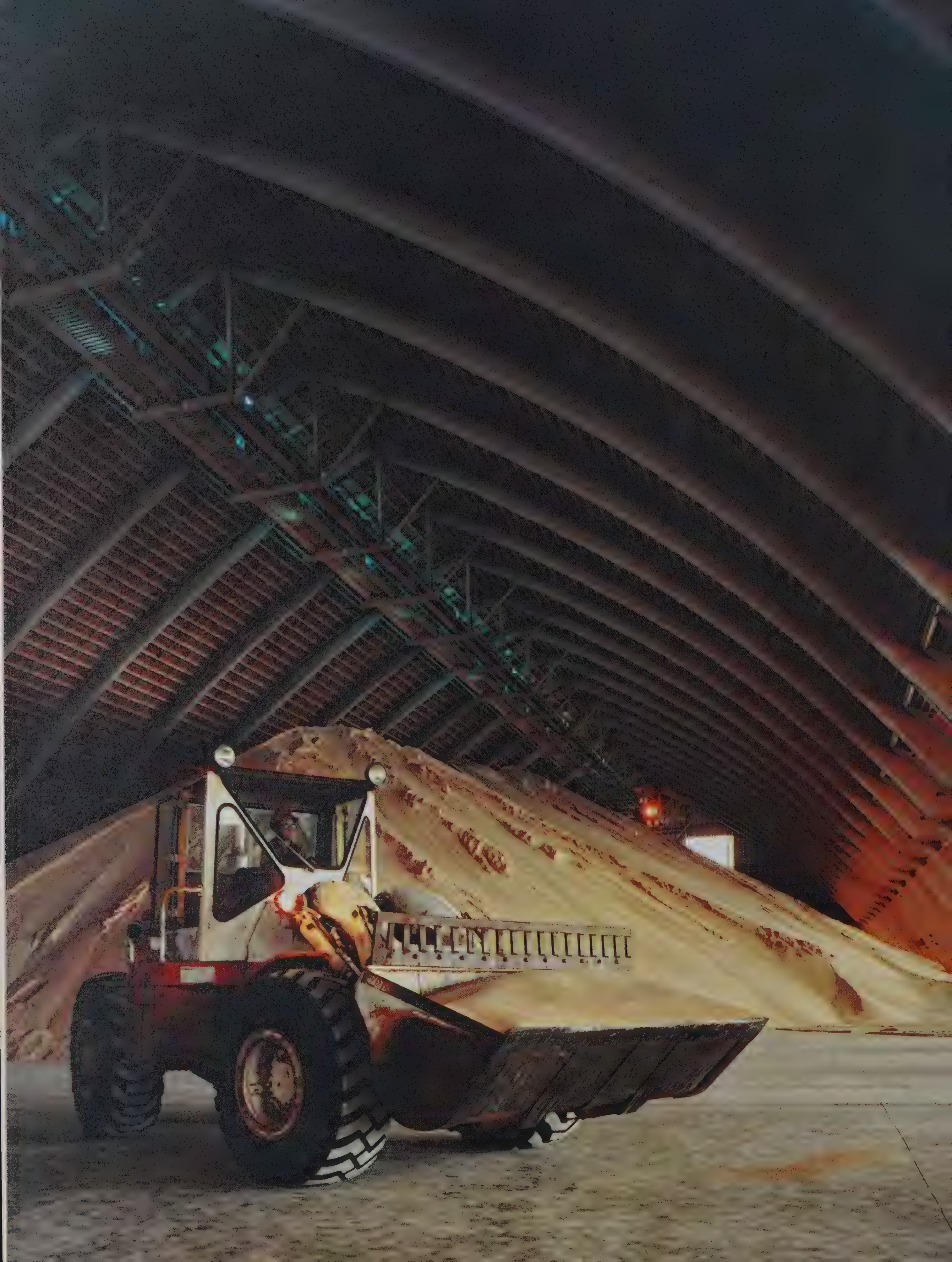
The implementation of a planned maintenance program was completed and resulted in a better utilization of manpower. The production engineering studies have identified a number of situations where costs can be reduced; other examinations of operations are still in progress. A review of materials management is underway and it is anticipated that there will be a considerable reduction of inventory plus improvements in materials handling and purchasing.

The Flin Flon workforce on January 1, 1972, totalled 2,725 employees; by December 31, 1972, the total had been decreased by 194 to 2,531.

During the year, 81 employees completed 25 years of service; at year-end there were 613 employees with 25 or more years of service on the payroll.

During the year revisions to the cost-reporting system were completed, which established cost centres for all phases of the operation and responsibility accounting as the method of reporting. In addition to establishing cost centres a system of budgetary control has been implemented.

Diamond drill rig in the Central Zone of Stikine Copper Limited's property in British Columbia.



Potash division

Sylvite of Canada

Production statistics for 1972, the second year of operations, are as follows: ore mined, 1,563,303 tons; ore milled, 1,494,034 tons; muriate of potash produced, 505,580 tons. During the year 497,351 tons of product were shipped.

A production milestone was reached on December 13 when the millionth ton of muriate of potash was produced. The first potash produced was loaded and shipped on September 25, 1970, and commercial production was begun on March 1, 1971.

Production was reduced during September, October and November in order to adjust inventory levels that had risen in the wake of the dock strike in Vancouver during August and September. In addition, sales in the U.S. Midwest were adversely affected by extremely poor autumn weather conditions that disrupted farmers' plans to fertilize their crop lands.

A change in marketing muriate of potash overseas occurred in June when Sylvite of Canada joined Canpotex Limited, an export marketing agency formed by producers in Saskatchewan. Canpotex is responsible for developing and servicing all overseas accounts. Sylvite's sales staff continued working closely with a major U.S. marketing agency to develop sales throughout the U.S. with special emphasis on the Midwest region. Canadian sales were handled by Sylvite's sales force.

During 1972 Sylvite shipped product to Australia, Brazil, Korea, Japan, Malaysia, the Philippines and Taiwan. As a member of Canpotex, Sylvite shared in the first-ever sale of Canadian muriate of potash to China, 65,000 metric tons valued at approximately $2.5 million. A member of Sylvite's sales staff was part of the three-man team that negotiated the sale during the Canadian Trade Exposition in Peking from August 16 to September 3.

Although the total cost of production was below budget, the unit cost per ton of product was slightly higher because of the lower-than-planned production. However, productivity and efficiency improved considerably over that obtained in 1971. The overall efficiency of mining operations, in terms of tons per man-shift, increased by approximately 50% to 150 tons per man-shift.

Capital expenditures during 1972 totalled $1,505,980; total capital expenditures to year-end 1972 were $66,352,818. It is estimated that an additional $2,520,973 will be spent during 1973 on various projects. Major projects completed during 1972 included an addition to the product storage building on surface, completion of both headframes and the underground shop plus modifications of various circuits in the refinery.

At year-end there were 186 employees on the payroll, 10 more than a year ago. Familiarization training sessions for employees and advanced classes for supervisory personnel were continued.

The emphasis on safety training was maintained throughout the year and the results were extremely encouraging. During the year there was only one lost-time accident, 14 injuries required medical aid and 101 minor injuries needed only first-aid treatment. As of February 14, 1973, the refinery and surface departments had operated for 471 days and the mine department 407 days without a lost-time accident. Two more teams are being trained in mine-rescue techniques and nearly 200 persons — employees and other interested persons from the area — attended first-aid training classes. In addition, officials of CP Rail conducted special safety classes, with the aid of films, for personnel working in the loadout area.

Public interest in the mine and refinery remained relatively high during the year and by year-end more that 1,800 persons had toured both facilities. Nearly 5,000 persons have visited Sylvite of Canada since public tours were started during the summer of 1971.

Potash in storage building at Sylvite of Canada's mine/refinery complex in southeastern Saskatchewan.

Subsidiary and affiliated companies

Hudson Bay Diecastings Limited

Sales of diecastings reached their highest level since the plant began operations in 1966. However, as was forecast last year, profits remained at a modest level. The intense cost squeeze on the automotive industry is reflected in reduced profit margins for the suppliers of components.

During the year the number of employees increased to 225 from 130 in 1971 and the plant operated on a three-shift basis during the last seven months of the year because of higher production requirements. There was a high turnover of labor because of stiff competition from welfare programs. On September 18, 1972, new two-year labor contract was negotiated two weeks in advance of the expiry of the old contract. The new contract expires on September 30, 1974.

Although the plant still remains heavily dependent on the automotive-parts field, some progress was made during the year toward diversification.

Zochem Limited

Late in 1971 Hudson Bay Mining acquired from subsidiary Zinc Oxide Company of Canada Limited the latter's wholly owned operating subsidiary, Durham Industries (Canada) Limited. In 1972 a new name, Zochem Limited, was chosen for Durham Industries (Canada) Limited because it reflected more accurately the scope and nature of the product line.

The production capacity of the zinc oxide and zinc dust plants was increased by 20% at the end of 1971 and both plants operated at 90% of the higher levels during 1972.

Sales of zinc oxide and zinc dust were substantially ahead of sales in 1971; sales of zinc oxide alone increased by 14%. However, it has become progressively more difficult to remain profitable due to the increasing cost of raw materials and the continuing depressed state of selling prices, primarily the result of the freeze of product prices imposed by the Price Commission in the United States. Zochem has a substantial market in the U.S. but because of that market's proximity and reciprocal arrangements such as the Automotive Trade Pact, Zochem is forced to keep Canadian prices competitive with the price of similar products available from other countries.

Although sales of zinc dust sales increased by 10% during 1972, it was decided that in view of the extremely low selling price that production of zinc dust be suspended indefinitely until economic conditions are more favorable.

The market for photoconductive-grade zinc oxide shows great promise and Zochem's product, Zocofax, has met industry approval and sales are currently being made in Canada, United States, England, Europe and Australia. As a result of a major research and development program begun in 1971, Zochem is now is a position to bring new photoconductive technology to the world market.

During November, a new two-year labor contract was negotiated and signed.

Francana Oil & Gas Ltd.

Sales of crude oil in 1972 rose by 19% to 1,204,000 barrels from 1,010,000 barrels in the previous year. Sales of natural gas totalled 2.26 billion cubic feet, compared with 1.54 billion cubic feet in 1971, an increase of 47%.

Income from all sources totalled $2,968,000, an increase of 14% over income in 1971. Earnings, after provision for deferred taxes, amounted to $650,000, compared with $811,000 in 1971.

The decrease in earnings is attributable to higher depreciation, depletion and interest charges plus investments in projects that augur well for the future but did not contribute to current earnings.

Proven reserves of crude oil at year-end were virtually unchanged from last year's total of 15,420,000 barrels. Proven reserves of natural gas increased to 84.1 billion cubic feet from 73.9 billion cubic feet at year-end 1971. In addition, there were 4,526,000 barrels of oil and 8.2 billion cubic feet of natural gas classified as probable additional reserves.

Exploration and development programs during 1972 included participation in the drilling of 24 wells, in which Francana's working interest averaged 29%, that resulted in six oil and four gas wells. The remaining 14 wells were unsuccessful and were abandoned. The Viewfield area of Saskatchewan contributed five new oil producers and added 800,000 barrels to Francana's reserves. One well was added in the Hays area of Alberta. Gas discoveries were made in the Trochu and Enchant areas of Alberta. Follow-up drilling in the Enchant area

Molten zinc being poured into diecasting machine at Hudson Bay Diecastings Limited near Toronto.

resulted in two gas development wells. It is hoped that reserves developed in both areas will be placed on production during 1973.

An additional 25 wells were drilled at no cost to the company on or offsetting lands in which the Company has an interest. One of these resulted in a dual-zone gas and oil discovery, in which Francana retains a 12½% working interest after payout. Four additional wells yielded oil during initial testing and were cased for further evaluation. Five wells yielded natural gas during initial testing and were also cased for further evaluation. Two wells were still drilling at year-end, and the remaining 13 wells were abandoned.

Activity in the Arctic Islands remained at a high level throughout the year with a total of 20 wells completed by the various groups of operating companies. The results were gratifying for a relatively virgin exploration area, resulting in four gas wells and one oil well. An important event during the year was the drilling of Panartic Oils Limited's Romulus C-42 well within two miles of Francana's lands on Ellesmere Island. The well reached a depth of 14,940 feet and oil shows were reported in three separate zones. Following the abandonment of this well, drilling was started at Panarctic Gemini E-10 on land in which Francana has a 15% interest. The well, spudded on October 15, 1972, was still drilling at year-end and Panarctic has not yet released any information about results.

A sales contract has been negotiated for gas from wells in the Strome-Holmberg area of Alberta. At year-end, a gathering system was under construction and plans were well underway to begin construction of a processing plant early in 1973.

Francana, through its wholly owned U.S. subsidiary, Francana Exploration Inc., holds a 22% equity interest in Trend Exploration Limited, a Denver-based company searching for hydrocarbons and minerals in North America, Britain, Indonesia, Italy, Spain and Australia.

During 1972, Trend reported several oil and gas successes in Colorado and in Alberta. The significance of these discoveries will be determined by further drillings in 1973.

In Indonesia, Trend et al made an oil discovery in a reef of tertiary age. Development drillings will be carried out in 1973 and it is hoped that production will start at an initial rate of 30,000 barrels per day in the fall of 1973. Further seismic work will be conducted simultaneously on the permit to delineate other reefal anomalies in the deeper portion of the sedimentary basin. Trend holds a 27% working interest in the 1.1 million acres covered by the production-sharing contract entered into with Pertamina, the Indonesian state-owned oil company.

The outlook for Francana in 1973 is for a continued increase in production income. The latest increases in the posted field prices for crude oil and the revenues from new wells going on stream should provide an increase of about 15% over production income in 1972. On the exploration front Francana plans to be as active in 1973 as it was in 1972. Follow-up drillings to Trend's discoveries will also be of great importance to Francana. In view of the energy-demand problem that is rapidly developing in the world, there are expectations of still higher prices for both crude oil and natural gas, which will contribute to the Company's earnings.

Francana Minerals Ltd.

An increase of 42% in sales of sodium sulphate, to 56,259 tons, was achieved in 1972, almost entirely due to rapidly growing demand from the detergent manufacturers. Detergent-grade product accounted for 40% of total sales and has risen to this level in the two years that Francana Minerals has been producing this grade.

There was a small increase in sales to the kraft pulp industry, originally the only major market for sodium sulphate. By the end of 1972, the kraft mills had recovered from two years of depressed sales and prices and a tight supply situation was developing for kraft products. Kraft mills should be operating at capacity in 1973 and postponed expansions or new mill construction will likely be started as prices of kraft products return to a profitable level. Many mills had reduced consumption as a result of newly installed pollution-abatement equipment. However, increased demand for sodium sulphate can be expected as existing mills reach full production and some new capacity comes on stream.

The first phase of a program to improve the recovery of raw material from the sodium sulphate deposit was completed and positive results were obtained. Further work is planned for 1973. When the project is completed, annual recovery should be increased and costs reduced.

The outlook for sales of sodium sulphate is promising in both of the main consuming industries. Despite higher sales, Francana's profit was reduced by very low prices in 1972 because of the severe competition for diminished markets. Price increases have been posted for 1973; since further increases are anticipated, the price for sodium sulphate should return to a more reasonable level.

Operating personnel

Base-metal mining, refining and smelting	**Flin Flon**	J. R. G. Sadler, general manager N. G. Ashby, manager — industrial relations J. H. Black, superintendent — surface and transportation J. R. Bray, manager — mines R. L. Bunn, superintendent — mechanical M. N. Collison, manager — plant services J. R. Conner, manager — personnel R. F. Coulter, superintendent — mill J. T. Dalgleish, superintendent — powerhouse G. H. Dash, superintendent — hydro plant S. H. Evans, superintendent — electrical J. E. Goodman, manager — metallurgy E. P. Haggarty, manager — administration N. Iannone, superintendent — safety M. A. Kirby, superintendent — mines, Flin Flon area J. N. Kirkbride, superintendent — research P. L. Martin, chief mining geologist W. E. McFadden, superintendent — zinc plant L. R. Nilsen, superintendent — mines, Snow Lake area R. F. Pearson, superintendent — smelter A. E. Stephansson, assistant to manager — mines F. H. Thompson, superintendent — construction R. A. Thomson, manager — computer services
Sylvite Division Potash mining and refining	**Rocanville**	D. C. Smith, general manager W. J. Anderton, superintendent — mill F. J. Greeves, manager — production J. E. Harper, manager — administration J. F. Kopchynski, superintendent — mine A. W. Phillips, manager — personnel
Head Office	**Toronto**	Dr. J. B. Howkins, chief geologist W. A. Atkinson, assistant comptroller M. A. de Vette, chief electrical engineer A. Epp, manager — public relations A. N. C. Gillies, manager — traffic D. H. Houston, manager — taxation T. A. O'Hara, manager — development group J. D. Purvis, manager — metal sales
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Subsidiary companies	**Montreal** **Toronto** **Calgary** **Regina** **Quill Creek, Yukon**	D. B. Clark, general manager — Zochem Limited G. F. Clark, general manager — Hudson Bay Diecastings Limited N. D. Knowles, general manager — Francana Oil & Gas Ltd. R. V. Tomkins, general manager — Francana Minerals Ltd. J. H. Walsh, mine manager — Hudson-Yukon Mining Co., Limited

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Crown Trust Company: Toronto, Winnipeg, Calgary, Vancouver

The Chase Manhattan Bank: New York, N.Y.

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Deloitte, Haskins & Sells: Toronto

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